Maribyrnong River Flood Review

## Melbourne Water’s questions of clarification to the Panel

## September 2023

Melbourne Water thanks the independent Review Panel for its work to review the causes of the Maribyrnong River flood which occurred on 14 October 2022.

A copy of the report of the independent Review Panel can be found here [yoursay.melbournewater.com.au/maribyrnong-river-flood-review](https://yoursay.melbournewater.com.au/maribyrnong-river-flood-review)

In accordance with the Terms of Reference for the Review, there is an opportunity for Melbourne Water to ask the Panel questions of clarification. Melbourne Water has asked the below questions of clarification of the Panel and is awaiting a response.

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| **Page No** | **Paragraph** | **Text** | **Melbourne Water questions of clarification** |
| 73 | 117 | Table 2: Summary of forecasts and warnings issued by Melbourne Water and the Bureau of Meteorology for the Flood Event.  (Source: Constructed by Review Panel from information provided). | Melbourne Water wishes to clarify the forecasts and warnings issued by Melbourne Water, as they relate to Table 2 in the Panel’s Report.  There is some additional information that we think would help present a complete picture of the flood warning timeline. For the Panel’s consideration, we have included the additional information in a version of the table below and re-ordered some of the events to accord with the chronology.  In summary:  Major Flood Warning 4 issued by Melbourne Water to the Bureau of Meteorology (**BoM**) at 8:12pm on 13 October 2022.  As a result, Table 2 in the Panel’s Report currently gives the impression that Melbourne Water did not meet its 6-hourly target because there is no update between 2:34pm and 12:30am.  In terms of order of events, the Keilor gauge exceeding minor flood level late on 13 October is in the wrong spot (i.e before the events of the day). Should be immediately after the 13 October 8.24pm flood warning.  Table 2 also does not include the following flood warnings from Melbourne Water to BoM, which we have added in to the table provided below:   * Major flood warning 6 at 2:51am on 14 October * Major flood warning 7 at 8:05am on 14 October * Major flood warning 8 at 2:12pm on 14 October * Major flood warning 9 at 7:49pm on 14 October * Major flood warning 10 at 11:54pm on 14 October * Final flood warning 11 at 11:42am on 15 October |
| 76 | 122 | The time that Melbourne Water's forecasting tools take to run needs to be reduced by approximately 50% for future forecasts produced by Melbourne Water to provide sufficient flood warning in an event such as the 2002 Flood Event. | Melbourne Water seeks clarification that 2002 should be 2022? |
| 79 | 129 | However, although impact generally occurred within the 1% LSIO, this was not always the case. For example, in the flood management plan for Maribyrnong City Council, which was developed by council in collaboration with Melbourne Water, only 293 properties were identified as being impacted by a 1% annual exceedance probability flood event, which is significantly less than the 512 properties which were actually impacted by the Flood Event | Melbourne Water seeks clarification of the basis on which the figure of 512 properties impacted by the Flood Event was calculated, including the definition of “property” applied and the extent of “flood impact”.  This clarification will assist Melbourne Water to determine if it is appropriate to compare the figure of 512 with the number of properties predicted to be impacted by the 1% AEP (which is identified as 303 properties in the 2016-21 Flood Management Plan for Maribyrnong Council – refer Appendix 4, Table 10).  The way in which “number of properties being impacted” is calculated depends on the definition of “flood impact” and “property”. It is possible that the figures of 293 and 512 properties in this paragraph of the Panel’s Report have been calculated using different metrics and should therefore not be compared.  The 293 properties identified in the flood management plan for Maribyrnong City Council (**FMP**) (refer Appendix 4, Table 10) is the number of residential properties within the Maribyrnong River 1%AEP within the Maribyrnong municipality. Total properties listed in the FMP is 303 (rather than 293) as the FMP also includes 10 commercial / industry properties within the 1% AEP flood extent.  Melbourne Water’s understanding is that the 512 properties identified as impacted by the flood event in Maribyrnong may be an overall figure based on the number of primary and secondary structural impact assessments completed. It is possible this figure includes individual homes, units, apartments, dwellings, businesses, etc with any level of impact, ranging from over floor flooding to a flooded garden, under croft parking, etc. It is therefore possible that many of the 512 properties did not experience flood impact as severe as that associated with a 1% AEP flood event. |
| 86 | 144-146 | Discussion about probability of flooding, including Table 3 | Melbourne Water seeks clarification of the level (in mAHD) to which these probabilities apply and the methodology and assumptions that were applied to derive the information in the Table 3 Occupancy Period flood risk, and to reach the conclusions drawn in paragraphs 144 to 146.  Melbourne Water seeks an understanding of what the probabilities in Table 3 mean and why they differ. For example, what is the difference between “flooding”, “once” and “more than once”? |

## Melbourne Water’s summary of forecasts and warnings issued by Melbourne Water and the Bureau of Meteorology for the Flood Event

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| **Date and time** | **Agency/Data source** | **Action or warning type** | **Comment** |
| Prior to 11 October at 12:11pm | Melbourne Water | Consulting with Bureau | Melbourne Water consulted with the Bureau about the need for an initial flood watch to be issued |
| 11 October at 12:11pm | Bureau of Meteorology | Flood Watch | Includes wording that minor to moderate flooding is expected across the flood watch areas, and that major flooding is likely in some catchments. Maribyrnong River is specifically listed as likely to be affected. |
| After 11 October at 12:11pm | Melbourne Water | Increased forecasting modelling and daily flood watch updates | Increased flood forecasting, modelling and flood outlook scenario development |
| 11 October at 4:57pm | Bureau of Meteorology | Severe weather warning for heavy rainfall | Issued for districts including Maribyrnong River catchment  Warning included wording that heavy rainfall may lead to flash flooding |
| 12 October at 12:03PM | Bureau of Meteorology | Flood Watch | Includes wording that minor to moderate flooding is expected across the flood watch areas, and that major flooding is likely in some catchments. Maribyrnong River is specifically listed as likely to be affected. |
| 13 October at 8:15am | Melbourne Water | Flood warning to Bureau | First Major Flood warning for Maribyrnong catchment sent to Bureau |
| 13 October at 8:24am | Bureau of Meteorology | Flood Warning | Major Flood Warning issued for the Maribyrnong River |
| From 13 October at 8:24am to end of event | Melbourne Water | Provision of 6-hourly updates to the Bureau | Melbourne Water continued to monitor and regularly update modelling and forecasting over course of event |
| 13 October at 12:50pm | Bureau of Meteorology | Flood Watch | Includes wording that minor to major flooding occurring or expected across several Victorian catchments.  Major flood warning current for Maribyrnong River |
| 13 October at 2.24pm | Melbourne Water | Flood warning to Bureau | Updated Major Flood Warning for Maribyrnong River sent to Bureau, based on revised forecast rainfall data. |
| 13 October 3:24pm | Bureau of Meteorology | Flood Warning | Updated Major Flood Warning issued for the Maribyrnong River.  Maribyrnong River expected to peak around Moderate Flood Level on morning of 14 October |
| 13 October at 3:42 pm | Bureau of Meteorology | Flood Warning | Updated Major Flood Warning reissued for the Maribyrnong River.  Maribyrnong River expected to peak around Moderate Flood Level on morning of 14 October |
| 13 October 8:12pm | Melbourne Water | Flood warning to Bureau | Updated Major Flood Warning sent to Bureau. |
| 13 October 8:24pm | Bureau of Meteorology | Flood Warning | Updated Major Flood Warning issued for the Maribyrnong River.  Maribyrnong River expected to peak around Moderate Flood Level on morning of 14 October |
| 13 October at 11:06 pm | Keilor gauge | Exceeded Minor Flood Level |  |
| 14 October at 12:30am | Melbourne Water | Initiated update to predictions | Noted that river was rising faster than model prediction and began updated model runs |
| 14 October at 2:01am | Keilor Gauge | Exceeded Moderate Flood Level |  |
| 14 October at 2:16am | Melbourne Water | Major Flood Warning to Bureau | Updated Major Flood Warning sent to Bureau. Noted that Major Flood Level predicted to be exceeded |
| 14 October at 2.25am | Bureau of Meteorology | Flood Warning | Updated Major Flood Warning issued for the Maribyrnong River  Maribyrnong River expected to peak above Major Flood Level on morning of 14 October |
| 14 October at 2.51 am | Melbourne Water | Major Flood Warning to Bureau | Revised updated Major Flood Warning sent to Bureau |
| 14 October at 2.43 am | Bureau of Meteorology | Flood Warning | Revised updated Major Flood Warning issued |
| 14 October at 2.55am | Keilor gauge | Exceeded Major Flood Level |  |
| 14 October between 8:00am and 9:00am | Keilor gauge | Flood peak | Peak at more than 2.5m above Major Flood Level |
| 14 October at 8:05am | Melbourne Water | Flood warning to Bureau | Update to the Major Flood Warning sent to Bureau |
| 14 October at 8:10am | Bureau of Meteorology | Flood Warning | Updated Major Flood Warning issued for the Maribyrnong River  Maribyrnong River expected to peak above Major Flood Level on morning of 14 October |
| 14 October at 1:47pm | Bureau of Meteorology | Flood Watch | Includes wording that minor to major flooding occurring or expected across several Victorian catchments.  Major flood warning current for Maribyrnong River |
| 14 October at 2.12pm | Melbourne Water | Flood warning to Bureau | Update of Major Flood Warning sent to Bureau |
| 14 October at 2:16pm | Bureau of Meteorology | Flood Warning | Updated Major Flood Warning issued for the Maribyrnong River  Maribyrnong River currently exceeding Major Flood Level and falling/steady. It is expected to drop below Major Flood Level on afternoon of 14 October |
| 14 October at 7.49pm | Melbourne Water | Flood warning to Bureau | Update of Major Flood Warning sent to Bureau |
| 14 October at 7:55pm | Bureau of Meteorology | Flood Warning | Updated Major Flood Warning issued for the Maribyrnong River  Maribyrnong River currently exceeding Moderate Flood Level and falling. It is expected to drop below Moderate Flood Level on the evening of 14 October |
| 14 October at 11.54pm | Melbourne Water | Flood warning to Bureau | Update of the Major Flood Warning sent to Bureau |
| 15 October at 12:00am | Bureau of Meteorology | Flood Warning | Updated Flood Warning issued for the Maribyrnong River  Maribyrnong River currently exceeding Minor Flood Level and falling. It is expected to drop below Minor Flood Level on morning of 15 October |
| 15 October at 11.42am | Melbourne Water | Flood warning to Bureau | Update of Flood Warning sent to Bureau |
| 15 October at 12:19pm | Bureau of Meteorology | Flood Warning | Final Flood warning issued for the Maribyrnong River. |

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| **More information**  For more information about the review of the Maribyrnong River flood event please call us on 131 722 or visit [Yoursay.melbournewater.com/](http://www.melbournewater.com/)maribyrnong-river-flood-review  For an interpreter, please call the Translating and Interpreting Service (TIS National) on 131 450  For speak and listen service, please call 1300 555 727 | **Like us**  facebook.com/melbournewater  **Follow us**  @MelbourneWater  **Visit us**  www.melbournewater.com.au |